IN THE CLAIMS:

The following claims will replace all prior versions of claims in this application.

1. (Currently Amended) A process for preparing an aligning substrate for liquid crystals, comprising the steps of:

providing an aligning substrate comprising an aligning film; and

bombarding at least a portion of the substrate with a plasma beam from a plasma beam source at an incident angle of greater than 0° to about 80° thereby inducing a surface anisotropy and ~~to produce~~ producing an aligning direction on the bombarded portion of the aligning substrate, wherein 0° is a position of the beam normal to the substrate.

2. (Original) The process according to claim 1, wherein the plasma beam source is a closed drift thruster.

3. (Original) The process according to claim 2, wherein current density of the plasma beam is about 0.1 to about 1000 $\mu A/cm^2$, and wherein the ion energy is from about 100 to about 5000 eV.

4. (Currently Amended) The process according to claim 3, wherein the bombarded portion of the aligning substrate imparts to a liquid crystal an alignment direction having an azimuth angle φ of about 0° and a zenithal angle θ of 0° to about 40°, or an azimuth angle φ of about 90° and a zenithal angle θ of about 0°, wherein the azimuth angle has a reference axis that is a projection of the plasma beam on the aligning substrate and the zenithal angle is the angle between the alignment direction and the aligning substrate.

5. (Currently Amended) The process according to claim 3, wherein said ~~controlled~~ closed drift thruster is an anode layer thruster.

6. (Currently Amended) The process according to claim 3, wherein the aligning film comprises polyvinyl ~~cinnimate~~ cinnamate, unsaturated polyester, polyimide, poly(meth)acrylate, polyvinyl acetate, glass, quartz, gold, indium tin oxide,

silicon, silicon oxide, hydrogenated diamond-like carbon, or hydrogenated amorphous silicon.

7. (Currently Amended The process according to claim 6, wherein the bombarded portion of the aligning substrate imparts an alignment mode having an azimuth angle φ of about 0° and a zenithal angle θ of 0° to about 40°, or an azimuth angle φ of about 90° and a zenithal angle θ of about 0°, wherein the azimuth angle has a reference axis that is a projection of the plasma beam on the aligning substrate and the zenithal angle is the angle between the alignment direction and the aligning substrate.

8. (Original) The process according to claim 6, wherein current density of the plasma beam is about 0.5 to about 30 $\mu A/cm^2$, and wherein the ion energy is from about 200 to about 700 eV.

9. (Original) The process according to claim 3, wherein the incident angle is about 20° to about 75°.

10. (Original) The process according to claim 9, wherein the incident angle is about 50° to about 75°.

11. (Original) The process according to claim 2, further including a step of forming a liquid crystal cell comprising the aligning substrate and thermotropic or lyotropic liquid crystals.

12. (Original) The process according to claim 4, further including a step of forming a liquid crystal cell comprising the aligning substrate and thermotropic or lyotropic liquid crystals.

13. (Currently Amended) The process according to claim 2, further including a step of ~~utilizing~~ placing a mask onto the substrate prior to said bombarding to prevent the plasma beam from reaching a predetermined portion of the aligning substrate.

14. (Currently Amended) The process according to claim 6, further including a step of ~~utilizing~~ placing a mask onto the substrate prior to said bombarding to prevent the plasma beam from reaching a predetermined portion of the aligning substrate.

15. (Original) The process according to claim 2, wherein the plasma beam is in the form of a sheet.

16. (Original) The process according to claim 6, wherein the plasma beam is in the form of a sheet.

17. (Original) The process according to claim 2, further including the step of moving the aligning substrate through a path of the plasma beam.

18. (Original) The process according to claim 4, further including the step of moving the aligning substrate through a path of the plasma beam.

19. (Original) The process according to claim 6, further including the step of moving the aligning substrate through a path of the plasma beam.

20. (Original) The process according to claim 1, wherein the aligning substrate is positioned at a distance of about 5 to about 50 cm from the plasma beam source.

21. (Original) The process according to claim 4, wherein the aligning substrate is positioned at a distance of about 5 to about 50 cm from the plasma beam source.

22. (Original) The process according to claim 6, wherein the aligning substrate is positioned at a distance of about 5 to about 50 cm from the plasma beam source.

23-50 (Canceled)

51. (New) A process for preparing an aligning substrate for liquid crystals, comprising the steps of:

providing an aligning substrate comprising an aligning film; and

bombarding at least a portion of the substrate with a plasma beam from a plasma beam source at an incident angle of greater than 0° to about 80° to produce an aligning direction on the aligning substrate, wherein 0° is a position normal to the substrate, wherein current density of the plasma beam is about 0.5 to about 30 $\mu A/cm^2$, wherein the ion energy is from about 200 to about 700 eV, wherein the aligning film comprises polyvinyl cinnamate, unsaturated polyester, polyimide, poly(meth)acrylate, polyvinyl acetate, glass, quartz, gold, indium tin oxide, silicon, silicon oxide, hydrogenated diamond-like carbon, or hydrogenated amorphous silicon, and wherein the plasma beam source is a closed drift thruster.

52. (New) The process according to claim 51, wherein the bombarded portion of the aligning substrate imparts to a liquid crystal an alignment direction having an azimuth angle φ of about 0° and a zenithal angle θ of 0° to about 40°, or an azimuth angle φ of about 90° and a zenithal angle θ of about 0°, wherein the azimuth angle has a reference axis that is a projection of the plasma beam on the aligning substrate and the zenithal angle is the angle between the alignment direction and the aligning substrate.

53. (New) The process according to claim 52, wherein said closed drift thruster is an anode layer thruster.

54. (New) The process according to claim 51, wherein the bombarded portion of the aligning substrate imparts an alignment mode having an azimuth angle φ of about 0° and a zenithal angle θ of 0° to about 40°, or an azimuth angle φ of about 90° and a zenithal angle θ of about 0°, wherein the azimuth angle has a reference axis that is a projection of the plasma beam on the aligning substrate and the zenithal angle is the angle between the alignment direction and the aligning substrate.

55. (New) The process according to claim 51, wherein the incident angle is about 20° to about 75°.

56. (New) The process according to claim 55, wherein the incident angle is about 50° to about 75°.

57. (New) The process according to claim 51, further including a step of forming a liquid crystal cell comprising the aligning substrate and thermotropic or lyotripic liquid crystals.

58. (New) The process according to claim 51, further including a step of placing a mask onto the substrate prior to said bombarding to prevent the plasma beam from reaching a predetermined portion of the aligning substrate.

59. (New) The process according to claim 51, wherein the plasma beam is in the form of a sheet.

60. (New) The process according to claim 51, further including the step of moving the aligning substrate through a path of the plasma beam.

61. (New) The process according to claim 51, wherein the aligning substrate is positioned at a distance of about 5 to about 50 cm from the plasma beam source.